UNIVERSITY OF MICHIGAN
NOV 6 1953
EDUCATION LIBRARY

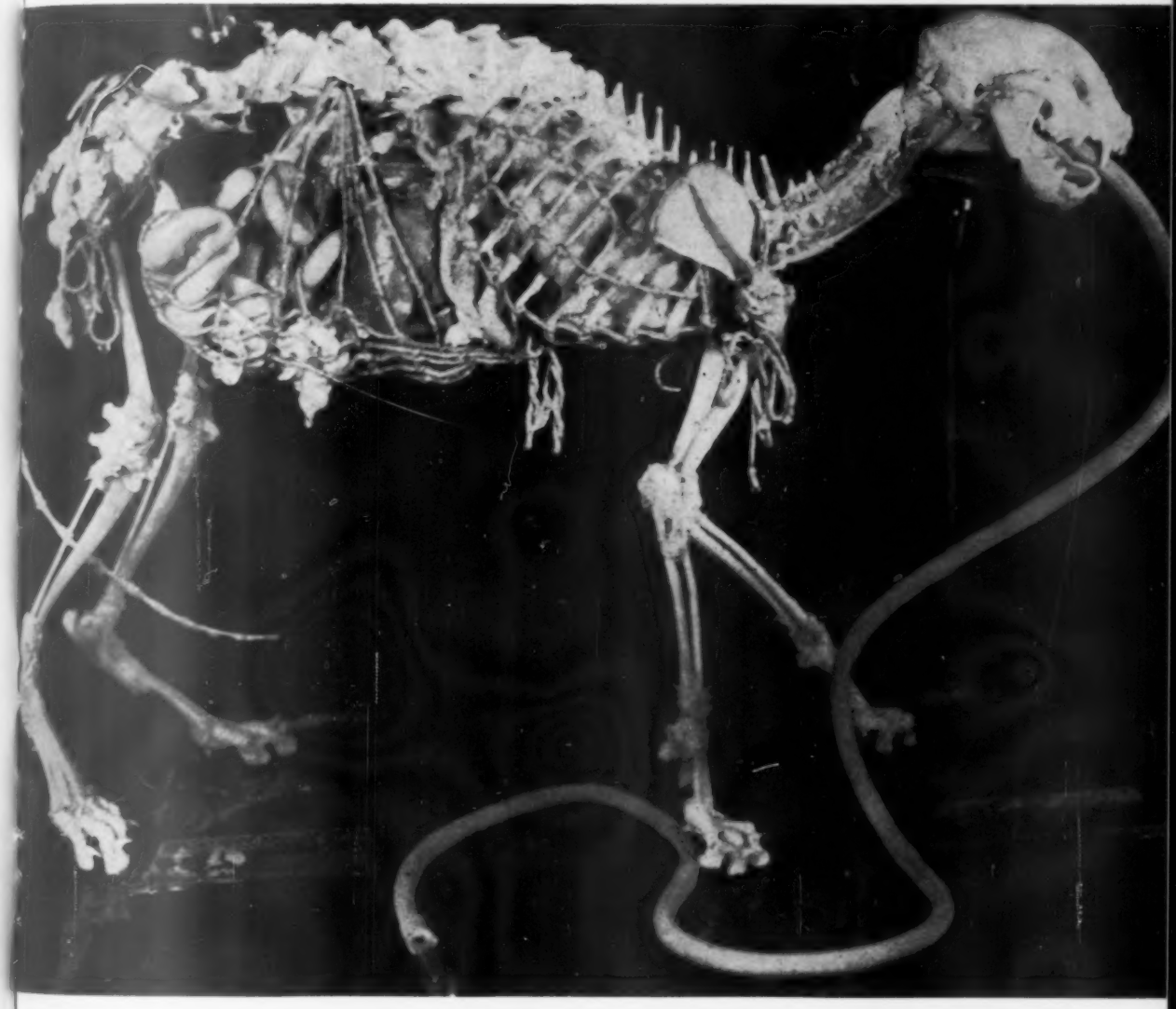
The American Biology Teacher

A PRACTICAL SERVICE AND IDEAS PUBLICATION FOR TEACHERS OF NATURE STUDY AND THE LIFE SCIENCES FROM THE ELEMENTARY GRADES THROUGH COLLEGE

Official journal of

The National Association of Biology Teachers

NOVEMBER, 1953 VOL. 15, NO. 7



Cat Skeleton-Viscera · Fear of Animals in Children · Biological Vocations · Regional Meeting · Visual Aids · Biology Clubs · Practical Teaching Techniques

Turtox Kodachrome Lantern Slides

Turtox Original Kodachromes offer you 2 x 2 inch lantern slides of thousands of subjects not available from any other source. These slides are sold singly (your selection) and also as carefully planned sets.

See the detailed listings on pages 444 to 506 of *Turtox Biology Catalog No. 55*, and also ask for the following lists of special Kodachrome lantern slides:

(1) Human and Mammalian Histology

(2) Amphibians and Reptiles

(3) Taylor-Turtox Kodachromes of Algae and Floral Structures

GENERAL BIOLOGICAL SUPPLY HOUSE
Incorporated
761-763 East Sixty-Ninth Place
Chicago, 37, Illinois

New 1952 Model!
35-mm. EXAKTA "VX"
Single Lens Reflex Camera

One lens both for viewing and picture taking assures perfect sharpness, accurate exposure, maximum depth of field, and correct composition for color. You always see the exact image before you take the picture—whether the subject is an inch or a mile away, whether it is microscopic or gigantic, whether it is moving or stationary. Instantly interchangeable lenses permit telephoto, wide angle, close-up, copy and microscope photography. **With f2.8 Zeiss Tessar "T" Coated Lens with Pre-Set Diaphragm Control ..... $279.80 tax included**

Write Dept. 900 For Free Booklet "I"

NATURE PHOTOGRAPHY WITH THE HIGH-SPEED FLASH by Alfred M. Bailey (Denver Museum of Natural History). This eminent explorer and scientist displays his finest Exakta photographs and others along with explanatory material. 35 full page photographs. 64 pages **50c**

EXAKTA CAMERA CO.

48 W. 29th St. New York 1, N.Y.

NEW FILMS

The following 16mm sound films were produced in collaboration with Glenn O. Blough, Specialist in Elementary Science, U. S. Office of Education; Austin L. Rand, Curator of Birds, Chicago Natural History Museum; and W. Earl Godfrey, National Museum of Canada.

LIVING SCIENCE SERIES NO. 1
consists of *Attracting Birds in Winter* and *Building Birdhouses.*
Each 6 mins., color, $60. Series $100.

LIVING SCIENCE SERIES NO. 2
consists of *Birds That Eat Fish, Birds That Eat Flesh, Birds That Eat Insects,* and *Birds That Eat Seeds.*
Each 6 mins., color, $60. Series $200.

These films illustrate the principles of science and correlate with leading textbooks in elementary science. For complete information on these and other films write:

Department BF,
INTERNATIONAL
FILM BUREAU, INC.
57 East Jackson Blvd., Chicago 4, Ill.

TESTA MICROSCOPES

A DISTINGUISHED LINE OF AMERICAN-MADE, LOW-COST SCHOOL MICROSCOPES.

LABORATORY SIZE, WITH LARGE, PROFESSIONAL INCLINING STANDS, PRECISE INTERCHANGEABLE OPTICS.

INSTRUCTION MANUAL FURNISHED. QUANTITY DISCOUNTS TO SCHOOLS.

MODEL F—100 to 725X **$92.50**
Parfocal triple nosepiece. Condenser stage with iris diaphragm. Coarse and fine adjustment.

MODEL H—50 to 700X **$82.50**
Parfocal double nosepiece. Low and high power objective. Coarse and fine adjustment.

MODEL G-3—100 to 400X **$59.00**
Triple divisible objective. Substage diaphragm turret. Most economical high school microscope.

MODEL S-2—75 to 250X **$33.50**
Double divisible objective. Simple and efficient for elementary science use.

SUBSTAGE LAMPS AND OTHER ACCESSORIES

Write for literature to Dept. ABT

TESTA MANUFACTURING CO.

418 S. Pecan St., Los Angeles 33, Calif.

HERBARIUMS

for Mounting, Analyzing, and Preserving Botanical Specimens

The Cameron Herbarium

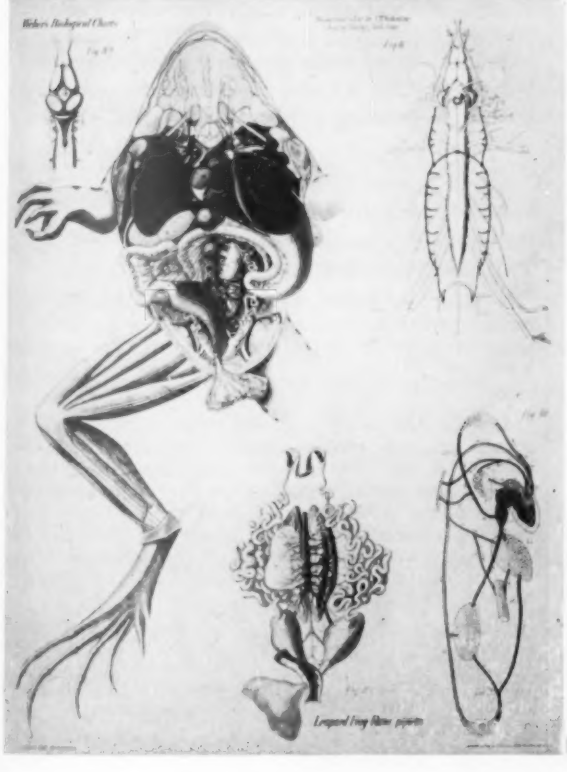
is most up-to-date in nomenclature and classification. That it is popular and practical is proved by its continued use by those who used the original edition, as well as by the new and increasing list of users each season.

The National Herbarium

is arranged on the check plan. It presents a complete botanical outline—the student analyzes the different specimens by placing check marks in the proper spaces.

H. L. FEIEREISEN, Publisher

Box 987 **Cedar Rapids, Iowa**



PRICES SLASHED!

WEBER BIOLOGY CHARTS

Lithographed in Color

We have undertaken for the Weber estate, the distribution of the remaining stock of the famous Weber Biological Charts. We felt that these beautiful charts should not go to waste for lack of a method of distribution, and while they last, prices have been reduced to a point where no Biology Department should miss this opportunity. No colored charts of any kind are now available at anywhere near these very low prices (less than half of regular prices) and another chance for a bargain like this, is very unlikely.

Stock is of course limited, and prompt action is desirable.

Charts are muslin-backed, with wood rollers:—
W-1 Cell Types (36″ x 48″) $3.75
W-3 Frog Anatomy (36″ x 48″) 3.75
W-5 Human Anatomy (36″ x 18″) ... 3.75

Return for full credit if not satisfactory.

NEW YORK SCIENTIFIC SUPPLY CO., Inc.

General Supplies for Biology and Chemistry

28 WEST 30th STREET NEW YORK 1, N. Y.

PHASE FILMS

present the basic, the impressive, the truly significant biological phenomena—the marvelous interrelation of tissue structure and function in living bodies, the beautiful precision of the hereditary mechanism of cells.

Subjects ready: - "Syngamy and Alternation of Generations in Allomyces a Water Mold"; "Plant Growth and Mutation"; "Cell Division"; "Meiosis."

Now in our sixth year. Write for previews or descriptive literature.

ARTHUR T. BRICE

PHASE FILMS ROSS, CALIFORNIA

THE AMERICAN BIOLOGY TEACHER

Publication of the National Association of Biology Teachers.

Issued monthly during the school year from October to May. Entered as second class matter October 26, 1939, at the post office at Lancaster, Pa., under the Act of March 3, 1879.

Publication Office—111 E. Chestnut St., Lancaster, Pa.

Editor-in-Chief—B. Bernarr Vance, Route 1, Box 175, Dayton 5, Ohio.

Associate Editors—Robert McCafferty, 371 Broad St., Wadsworth, Ohio; Paul Klinge, 246 Ohmer Ave., Indianapolis 19, Ind. **(To receive all manuscripts for major articles.)**

Managing Editor—Muriel Beuschlein, 6431 S. Richmond, Chicago 29, Ill.

Assoc. Managing Editor—Robert Gering, Dugway Proving Grounds, Tooele, Utah.

Subscriptions, renewals, and notices of change of address should be sent to the Secretary-Treasurer, John P. Harrold, 110 E. Hines Ave., Midland, Mich. Correspondence concerning advertising should be sent to the Managing Editor.

Annual membership, including subscription, $3.75, outside United States, $4.50.

The American Biology Teacher

Vol. 15 NOVEMBER, 1953 No. 7

TABLE OF CONTENTS

Cat Skeleton-Viscera ..... M. C. Miller 177
Relieving Anxiety and Fear of Animals in Children ..... John D. Woolever 178
Opportunities for Employment in the Biological Sciences ..... H. C. Nelson 180
Regional Meeting With AIBS 182
National Membership Chairman 182
Why Should I Be a Member of NABT? .. 182
Across The Editor's Desk 183
Letters 184
Sources of Strip Films and Color Slides J. M. Sanders and Committee 184
Biology Clubs as Teaching Tools Robert L. Smith 186
Biology Laboratories 188
Books For Busy Biologists 190
Association Officers and Editorial Staff .. 192
Biology in the News 193

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, AS AMENDED BY ACTS OF MARCH 3, 1933, AND JULY 2, 1946

Of *The American Biology Teacher*, published monthly October to May, inc. at Lancaster, Pennsylvania.

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher: Science Press, Lancaster, Pennsylvania.

Editor: B. Bernarr Vance, Route 1, Box 175, Dayton 5, Ohio.

Managing Editor: Muriel Beuschlein, 6431 S. Richmond, Chicago 29, Ill.

Business Manager: *none*.

2. That the owner is:

The National Association of Biology Teachers.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are:

None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear on the books of the company; also that the said two paragraphs contain statements embracing affiants full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear on the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

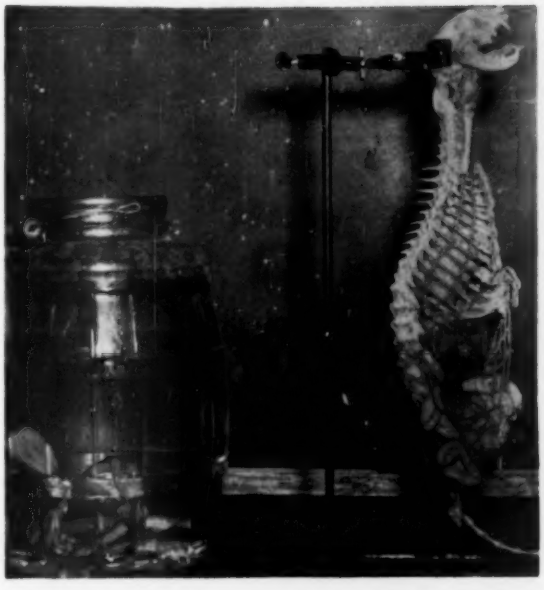
B. Bernarr Vance,
Editor-in-Chief

Cat Skeleton-Viscera (A Teaching Device)

MARCELLUS C. MILLER, Phillips High School, Battleboro, North Carolina

Preparation: The cat skeleton-viscera display (see cover photo) is prepared from a large freshly killed cat specimen. The tissue is preserved during the one or two days of preparation by direct and heavy salt application to tissues. Digestive tract and lungs are properly cleared by washing before addition of the salt. Air is then forced through the trachea into the lungs, under water; this removes blood from the lung tissue, and prevents tissue breakage. A rubber tube, with a glass dropper at each end, conducts air to the lungs and helps remove blood. The posterior and anterior appendages are then cut off, and the muscles are removed, leaving all ligaments at the joints. Careful dissection removes tissue where desired, baring the skeleton. The brain is removed through an opening at the base of the skull. Viscera are left intact, with tissue support to the spinal column. The diaphragm is left attached to the ribs and spinal column. Viscera are adequately supported in a net of string made for this purpose, and the ribs are given extra support by stringing with cord. Appendages may be replaced at will and held by special cords.

After removal of all major tissue, baring most of the skeleton, the specimen is placed in 10% formalin and allowed to stand over night. Water is then permitted to run into this solution for a half day. The remaining solution at the end of this period is poured off. The large glass container is refilled with 15% formalin, which keeps the specimen indefinitely. The solution may be replaced once or twice a year. This specimen is durable and, with proper care, withstands a long period of use.



The cat skeleton-viscera specimen, with appendages removed, can be placed in a large jar of formalin solution for storage.

Uses:

1. *Respiration:* The lungs may be inflated at will through a rubber tube fitted with two droppers—one at each end. The diaphragm is forced into movement by the inflated lungs. The lungs move outward, pressing against the ribs, and upward, pressing against the spinal column. Small particles taken into the lungs may be found embedded in the surface of lung tissue!
2. *The Digestive Tract:* The digestive tract may be filled with air or liquid through the same tube by careful readjustment of the tube and movement of the epiglottis. The improvised net, supported by the spinal column, the sternum, and the pelvic girdle, expands to permit the inflation of the intestines and the stomach. The pyloric valve may be illustrated by inflating the intestinal tract first through the oesophagus and then through the anus.
3. *Relative Anatomical Position:* The specimen offers a view of the mammal comparable to a progressive X-ray series. It illustrates dynamically the functional importance of the great internal body sheath (Mediastinal Pleura) which sepa-

Special note to teachers: No directions for the superficial dissection of the cat are given because of space limitation and the availability of this information in many good texts on the anatomy of the mammal. One such text is "The Functional Anatomy of the Mammal," by W. James Leach, McGraw-Hill Book Company, Inc., New York and London. The Skeleton-Viscera Preparation does not require injection, since the preserving solution may easily reach all parts of the specimen.

rates the two lung cavities from each other. Contortion of the spine may be illustrated without injury to the specimen. Many uses not mentioned may be found by instructors who prepare this teaching aid.

Relieving Anxiety and Fear of Animals in Children

JOHN D. WOOLEVER, 16196 Kentucky, Detroit, Michigan

Editor's note: This article completes Mr. Woolever's earlier discussion of children's fears of animals in the May issue.

From the survey taken it was seen that many common animals are feared by children who in reality have little or no reason to do so. It has been established some time ago that anxieties interfere with the normal activities of children. Accepting the objectives of modern educators, it is the science teacher's job to try to eliminate unnecessary anxieties and fears in children. Doing this will result in a more desirable, mature individual.

Photo by N. Levine

Common Garter snakes make good pets and aid in dispelling the misconception that snakes are slimy and their tongues are harmful. When a child loses his fear of snakes he frequently finds it easier to work with other animals he feared, or had false ideas about.

In eliminating a learned fear, such as those we are dealing with, it is of prime importance to understand the fear and the basis for it. Even though a fear is groundless it is important to place yourself in the child's position. A fear cannot be dismissed by logic or argument. Reasoning is often useless. Never consider a child a coward, much less call him one. Never ridicule his feelings. Fear of some things are natural for children at certain ages. To conquer a fear it must be done on the child's own level and from his viewpoint. An adult frequently doesn't recognize real fear in a child. A child does not always admit his real fears and questioning doesn't bring out an honest answer. A big obstacle in correction is the fearful parent of a fearful child. When progress is slow, it might be that the science teacher is working with more people than he suspects.

We are not concerned with phobias or obsessions that have a hidden meaning behind them. These cases are for the psychoanalyst. The science teacher should attempt to relieve his students of ideas and feelings that are unfounded or simply irrational.

Fear can be used to advantage to impress a person, and can be very educational. Fear itself is a warning signal and is good in innumerable situations. To be entirely fearless can be utterly foolish. Sensitivity of the child to certain things usually determines what he will fear. Sounds, odors, sensations and movements are common causes of fear or they may be feared themselves. Understanding what is feared is half the solution to our problem.

From the survey, results show that most of the fears and anxieties were learned. This makes it easier for the science teacher to relieve the child of his anxieties. There is no magic formula which will guarantee success in every case. A few of the most successful methods used by the author will be discussed here. It is believed that not one method used once but a combination of several with persistence over a long period of time, is probably the best solution. Assuming that the first step has been taken, viz., understanding the children's problems and knowing which factors are to be eliminated, the following methods have been found to be most successful:

1. Have animals become part of the child's science room environment. This includes living speci-

mens, models, dioramas, pictures or mounted specimens. Spring is an ideal time for introducing many small animals which may change and grow while the pupils watch and become acquainted with their natural activities. Showing films and taking field trips helps too.

2. Disseminate factual information concerning the animals. This may be in the form of reports, lectures, speakers, reading, or informal discussions. A good background of knowledge aids when the situation calls for logic and rational thinking. An insect with sucking mouth parts can't bite. Snakes without venom are not poisonous.
3. Experiment and demonstrate the behavior and reactions of animals under certain conditions. Show that animals are easily frightened by things which children may think are normal and not frightening to them. A child's seemingly ordinary behavior may sometimes result in both the pupil and animal being frightened or injured. Impress upon them the importance of their own behavior, in the presence of animals.
4. Handle the animals yourself and give the children many opportunities to do so, with due consideration for the animals. Sudden or over exposure is worse than deliberate avoidance. Never force the child to hold the animal. Sometimes another child holding the animal lends encouragement or even having the child put his hand under the one that is holding it brings the act from one of pretense to one of actuality. Voluntary petting is a good sign of progress.

Photo by J. D. Woolever

When older students work with youngsters who are fearful of some animals, they instill confidence and often aid in conquering anxiety. Here a hibernating bat is shown to an elementary student. Fear of bats because of what they look like and supposedly do to a girl's hair, is quite widespread.

5. Work with mounted or preserved specimens, especially in extreme cases of anxiety. Whenever the occasion arises try to have as many as possible examine the parts of the animal, noting the parts which are supposedly so threatening.
6. Permit the children to care for the animals. Assign each child a certain job which involves frequent although not necessarily bodily contact with the animal. Rotate their duties and obligations. The animal's position will change from one of a wild dangerous creature to that of beloved pet; the child from an anxious defendant to a tender protector.
7. Encourage the child at every opportunity. Whenever he shows the least bit of progress in alleviating his anxiety, be it just in patting the animal or merely cleaning its cage, he will gain confidence and increase his sense of achievement. Conquering a fear is an accomplishment and confidence is needed in every step.

When victory over fear is fairly certain, it is then safe to mention the ever expanding exceptional cases that appear now and then. These include stories of the cow that killed the farmer, or the man who died after a garter snake bit him. Stories such as these frequently retard progress. Impress upon the children that they are difficult to prove and even if true they are unusual cases and there may be extenuating circumstances that might change the interpretation of the story.

It should be remembered that when real or possible dangers do exist, they are not to be ignored, but thoroughly explained. The children should also be instructed as to when to expect danger and what is proper behavior when the danger is present. This is especially true as in the treatment of bee stings, snake bite, and the like. Above all, regardless of what methods are used to alleviate irrational fears and needless anxieties one of the best is to set a good example for the students. A well organized science room with many living things and a science teacher with an understanding of children's feelings are important steps on the way to relieving needless anxieties and fears in children.

Your Editor covets your suggestions and frank criticisms for improving the attractiveness and usefulness of **YOUR ABT?** It will be what you aggressively want it to be!

Opportunities for Employment in the Biological Sciences

HILMER C. NELSON, Wilson Branch, Chicago City Junior College

Frequently teachers of biology as well as vocational counselors are confronted by students with such statements and questions as "I like biology. What kind of biological work offers the greatest opportunities, or the best chances for success? Do I have the aptitudes that are necessary for success in this field? What financial returns can I expect to receive in this particular occupation? What are the opportunities for advancement?" These and many other questions must often be answered by teachers who have very limited experience in such counseling.

Recently the writer, who has spent many years counseling students in the pre-professional fields of biology, accepted an invitation to represent the field of biology on the Biological Science Panel at the Fifth Chicago Area Career Conference. In preparing for this task he was able to confer personally with employers of biologists in the industrial and educational fields, and to correspond with biologists who are currently employed in biological work in federal, state, and local community services, and in private enterprise. A close study of books, pamphlets, and articles published in journals and magazines has yielded additional information on careers in biology. The results of this investigation have been prepared in the form of a series of summaries in which the most important facts regarding each occupation are presented. The first of this series is presented below; others will follow later. It is hoped that each will be useful to both teachers and students at the high school and college level. It must be kept in mind, however, that opportunities in a given field in biology may undergo changes from year to year, due to scientific advances and changes in the world political situation.

THE HORTICULTURIST

1. Nature of the Work. A horticulturist applies scientific methods to the production and breeding of all types of plants except field crops. These plants include flowers, greenhouse plants, ornamental shrubs, trees, vegetables, fruits, berries, and nuts. He selects and determines: soil requirements for the particular crop; suitable fields; kind of spraying needed; whether irrigation is required and, if it is, how much and what type; kind and amount of fertilizer to be used; pollination requirements; plant varieties most suitable for his purposes. He plans and manages harvesting and marketing of crops. He applies known techniques of selection, hybridization, mutation and inbreeding of plants. He is trained in the technical design of experimental data; preparation of scientific reports, and non-technical bulletins.

Horticulturist Riemersma, *Park Manor Greenhouses, Chicago*, surveys work in his growing beds.

Some types of activities reported by those engaged in this field are:

a. Teaching; research; extension work with horticulture, particularly pomology or fruit-growing.

b. Teaching and research related to post-harvest physiology of fruits.

c. Research for a large chemical company.

d. Assisting canning companies in procuring raw products, planning field operations, and predicting crop yields and maturities.

e. Research concerned with citrus production. This includes certain aspects of nutrition, soil and plant analysis, root-stocks, and plant disease control.

f. Development of new varieties of tomatoes, cucumbers, and squash which have disease resistance, high nutritive value, and other desirable horticultural characteristics; maintenance of foundation stocks of seeds of important vegetable varieties.

2. Educational Requirements in the Field. A professional horticulturist usually possesses the minimum of a bachelor's degree in horticulture or some related or specialized branch of the plant sciences; for example, botany, plant pathology, agronomy, pomology, olericulture, plant genetics, or floriculture. In a few cases formal professional training is more limited, but is followed by many years of progressive and varied professional experience. For entrance into and advancement in teaching and research in universities which maintain horticultural departments the M.S. and Ph.D. are practically indispensable.

Biologists currently employed in horticulture reported the following educational qualifications:

a. B.S. degree, preferably in horticulture; M.S.; Ph.D. in some particular phase of horticulture, such as pomology.
b. Doctorate in plant physiology, horticulture, or biochemistry.
c. Doctorate in horticulture and several years of field experience with fruit-growers and farmers.
d. Horticultural, farm, and educational extension experience; field service with a canning company.
e. Ph.D. is required by most agricultural experiment stations; also essential is a good background in applied and theoretical horticulture, general botany, plant physiology, chemistry and agronomy.

3. Present Opportunities for Employment. Most men in this field are employed by state agricultural experiment stations, the U. S. Department of Agriculture, and by colleges and universities. Others work for packers, canners, seedsmen, and fertilizer manufacturers.

The following statements are by persons in the field of horticulture:

a. "Jobs are opening every year in government and state work; also in selling materials to fruit growers. With a Ph.D., we are usually trained in plant physiology or soils rather well, and thus can be specialists in these fields also."
b. "The opportunities at present are good."
c. "Most chemical companies are enlarging information and research departments."
d. "Opportunities in the canning industry are limited. Only two canning companies are using the services of horticulturists, but these companies are offering increased opportunities."
e. "In 1950 the supply was considerably less than the demand. At present the situation is still fairly good, although the gap has narrowed considerably. Unfortunately the demand picture is a rather inelastic one."
f. "The opportunities are excellent for men who are willing to start at a modest salary and work long hours."

4. Salary Range. The best financial opportunities are available to those who have sufficient capital to enter the retail florist business, or to become operators of commercial greenhouses. The range of salary for employed persons is as follows:

a. *Federal Government.* Starting salary: $7,040. Maximum salary: $9,360.
b. *College and university teaching.* Starting salary: $4,000. Maximum salary: $12,000.
c. *Industry.* Starting salary: $3,000 to $6,000. Maximum salary: $10,000 to $15,000.
d. Operator of a commercial greenhouse: $0000. to no limit.

5. Important Advantages in the Field. There are many important advantages, some of which are listed below:

a. Pleasure of bringing crops to maturity.
b. Dealing with fine people in general.
c. Problems in the field present a strong challenge to initiative.
d. A reasonable sense of job security frees the mind for greater accomplishment.
e. Salaries are high in industrial work.
f. There is a bright future for greater service to society and agriculture.
g. A fair degree of independence is permitted in research.
h. Creative stimulation comes with finding and developing new things.
i. There is ample opportunity to publish important findings.
j. Little or no travel is involved.
k. Much work is carried on in the healthful out-of-doors.

6. Important Disadvantages in the Field. Among the disadvantages are those listed below:

a. The necessity for patient work requires considerable unpaid overtime.
b. Results are by necessity and by the nature of plant life rather slow in coming.
c. Routine and monotony may end in blind alleys on particular problems.

d. Some salaries are rather low and not commensurate with the time and cost of prerequisite study and training.
e. The work requires active and exacting performance.
f. It is necessary to keep up to date on published information.

7. Special Requirements as to Personality, Skills, and Other Characteristics Peculiar to the Field. These special requirements are listed below:

a. Complete mastery of arithmetic, speaking, and writing.
b. Ability to do careful work.
c. Love of plants and the soil.
d. Patience and interest.
e. Ability to analyze data and design experiments.
f. Ability to present findings to both research personnel and men in the field.
g. Ability to get along reasonably well with people, to lead them, and to teach and work with them.
h. Ability to translate technical details into operational use.
i. Ability to meet and impress farmers.
j. An inquiring mind.
k. Tenacity in staying with a problem until it is solved.

References

Handbook of Descriptions of Specialized Fields in Horticulture. National Roster of Scientific and Specialized Personnel, Bureau of Placement, War Manpower Commission, Washington 25, D. C.

Salaries in Representative Universities and Teacher Training Institutions for 1952–1953. Director of Research, American Federation of Teachers, Chicago 4, Illinois.

Career Service Opportunities in the U. S. Dept. of Agriculture. Agriculture Handbook No. 45, U. S. Dept. of Agriculture, Washington, D. C.

Regional Meeting With AIBS

Past-Pres. Harvey Stork programmed NABT's Regional Meeting held in conjunction with the Annual Meeting of the American Institute of Biological Sciences at Madison, Wisconsin, Sept. 6–10. Of particular interest to teaching biologists, in two joint sessions held with the Teaching Section of the Botanical Society of America, were: "Preparation of Botanical Models and Lantern Slides from Sheet Plastic," F. W. Stearns; "The Use of Colored Chalk and Easel in Teaching Botany," S. N. Postlethwait; "A Demonstration of the Use of a Deep Freezer as a Teaching Aid in Plant Taxonomy," J. W. Thomson. A session on "Training of Conservation Workers," moderated by Dr. F. Schmeeckle, brought together Conservation Education experts from Wisconsin, Minnesota, and Michigan. NABT members will find most full texts or abstracts of papers in *AIBS Bulletin.*

The final session included a trip to the University Arboretum. Members of NABT's Executive Board present agreed unanimously that another Regional Meeting should be planned with AIBS at Gainesville, Florida next fall. Officers of the Teaching Section of Bot. Soc. of America indicated a desire for at least one joint meeting with NABT then.

National Membership Chairman

H. Seymour Fowler, Nat'l Membership Chairman, is Ass't Prof. of Biology at Iowa State Teachers College and Director of the Iowa Teachers Conservation Camp. After graduation from an upstate New York rural high school he entered Cornell University, working under Dr. E. Laurence Palmer. Following graduation from Cornell in 1941, Fowler entered military service. As a member of the 9th Infantry Division he saw service in North Africa, Sicily, England, France, Belgium, and Germany. After the war, 1945–46, the new Membership Chairman completed the requirements for the M.S. degree at Cornell University. Then followed three years of public school teaching in rural schools of upstate New York. During 1949–51 Fowler served as Assistant in Science Education at Cornell University, while completing the work toward the Ph.D. in the field of Nature and Science Education. Fowler's thesis involved the study of the ecology of a small depleted pasture land area. It was the purpose of the study to demonstrate that such an area could be utilized effectively in the teaching of high-school biology. During 1951–52 the new Membership Chairman was Ass't Prof. of Science Education at Southern Oregon College, Ashland, Oregon. Fowler's major interests are in nature, science, and conservation education.

WHY SHOULD I BE A MEMBER OF NABT?

This is a question which is often asked of those who work in membership promotion. In the not-too-distant past, a potential member could have been gained merely by the mention of the gains to his professional future through membership in a national organization. Today, things are different. Biology teachers are today not only professionally minded, but also of a practical nature.

They want to see some real returns from their investment in membership dues and from their time devoted to service to the organization. How does today's NABT propose to serve this need? In other words, let's analyze just what we do receive in return for our investment.

I believe we can safely say that our membership dues are the lowest in the nation—that is, if we compare NABT dues with those of other similar organizations of international scope. For this investment we receive eight issues of the only journal devoted to the *teaching* of the life sciences. There are, of course, dozens of fine journals devoted to the various divisions of biology. Ours is the only one devoted to the *teaching* of biology. In *The American Biology Teacher*, teachers write for teachers. We have an opportunity to share our teaching experience with others who have similar problems. It is hoped that all of our members will join in making the journal more effective by contributing. An article published in *The American Biology Teacher* not only brings the author a feeling of satisfaction, it also gives him professional prestige.

Membership entitles the biology teacher to the privilege of attending professional meetings of the Association where he gains new insight into recent developments in the field. He is able to make lasting friendships with other persons who have similar interests and problems. He takes back from these meetings ideas as to "how to do a more effective job." Members are invited to serve on a large number of active Association committees. With such service the member begins to feel that he "belongs." Our Association is not intended to be one in which a few carry all the responsibility and so reap all the benefits. We request that all members make their wishes known as to their particular committee interests. There is opportunity for all to contribute. Committee membership means work, but it also brings satisfaction.

These are some of the things which are evident to us who are already members. In addition these are a few of the points which we might use to interest potential members. Let's not forget that our Association is only as strong as its membership. In these days of high costs, strong membership means a large number of active members. We urge you, as members, to take a personal interest in helping our organization grow by inviting your friends to join NABT. If every present member would secure one new member, we would be well over our goal of 5000 members this year. Is that asking too much of you for YOUR Association? **Let's each feel a personal obligation to secure at least one new member before the close of 1953!**

H. Seymour Fowler
Nat'l Membership Chairman

Across The Editor's Desk

UNESCO's Natural Science Division Director, **Dr. Gerald Wendt,** envisions an **International Federation of Science Teachers** in the not-too-far-distant future. Are you interested in seeing such a common meeting ground established for science teachers of the world? If so, may we have your thoughts and ideas, particularly those of you who are our members in foreign countries?

Selected Science Teaching Ideas of 1952, edited by **R. Will Burnett,** contains many practical ideas for promoting interest in the life sciences, and an excellent article on The Unit Assignment in Biology by **Irene Hollenbeck,** biology teacher at Salem High School, Salem, Oregon. It is obtainable from National Science Teachers Ass'n, 1201 Sixteenth St., Washington, D. C.

The October meeting of our affiliate **New England Biological Association** was held at Fitchburg State Teachers College under the direction of **Dr. Helen Ross.** Conservation was the theme. **Malcolm Campbell,** charter member, co-organizer, and past officer of NABT, is President of NEBA for the second time, and NABT Regional Chairman **Mabel Potter** is Secretary. We haven't heard from you in a long while directly, Malcolm.

St. John's University, Brooklyn 6, N. Y., has extended the curriculum of the Dept. of Biology to enable study for the Ph.D. degree. **Dr. D. M. Lilly,** Chairman of the Graduate School's Dept. of Biology, will be in charge of the doctoral program.

Dr. Isaias Raw, NABT member of the faculty of **The University of Medicine, Sao Paulo, Brazil,** is supervising the publication of a journal of science for teachers and college students. The journal has been named *Cultus*, and is particularly concerned with experimental teaching in the life and other sciences. Dr. Raw is anxious to collaborate with us in planning teaching devices and materials. Those of you who are proficient in Spanish and Portuguese would profit mutually from contacting him.

Seeds For Democracy is a worthy project designed to provide an opportunity for school classes to contribute packets of such seeds as Chinese cabbage, soy, bush, and pole beans, tomato, squash, peas, mustard, eggplant, and cabbage to the struggling people of the Philippine Islands Republic. If interested in such a project for your biology classes, or nature study classes in the elementary grades, write to SEEDS FOR DEMOCRACY, San Francisco, Calif., for more information, posters, leaflets, and collection envelopes. Interesting life science **pen-pal relationships** can be had in this way with Filipino boys and girls, who have been taught to read and write English in their schools.

Wharton Centre, a Philadelphia settlement house, has published a pamphlet, *Operation Street Corner*, which tells of its experiences and work with street gangs in high juvenile delinquency areas. The Centre would welcome questions from teachers interested in details of the project as guidance for similar work elsewhere. Write to Wharton Centre, 1708 North 22nd St., Philadelphia 21, Pa.

Harvey E. Stork, genial Past-President of NABT writes that he "played hookey" from college duties this past summer, but we happen to know that he was very busy as usual on the Staff of Ansel Hall's lodge at beautiful Mesa Verde National Park and promoting the details of NABT's cooperative meeting with AIBS in early September. Harvey is now back at Carleton College, Northfield, Minn.

Robert Gering points out that *The American Biology Teacher* is the only Journal of its kind devoted to serving both professional biologists and teachers of the life sciences and nature study from the elementary grades through college. Members should capitalize on this fact in actively securing new members and in making local advertising contacts to send to our Managing Editors. Increased membership and circulation of our Journal makes us more attractive to advertisers, and makes possible increased services. **If every present NABT member would secure at least one new member this year, we would be well over our goal of 5000 members.** I have pledged myself to secure at least five new members—will **you** get one or more?

There is a tremendous interest in **"skin-diving"** at present, and biologists have found it a practical and unique method of studying aquatic life in its natural habitat. Popular books such as Eugenie Craig's *Lady With A Spear*, and Capt. Cousteau's *Silent World*, are well worth your reading. Assoc. Managing Editor Bob Gering would like to get in touch with all NABT members and others who are interested in any phase of "skin-diving" in order to set up an Exchange Center for this popular sport and biological technique. His address is in the Journal masthead.

Mr. Albert Antrei, teacher at Manti High School, Manti, Utah and NABT member since 1945, is among the 20 outstanding high school teachers selected to attend Columbia or Yale Universities under Grants from the **John Hay Whitney Foundation.** His research and study will deal with relationships between science courses and the humanities. Congratulations, Albert!

LETTERS

Dear Mr. Vance:

I was amazed to discover recently how few people in our organization were familiar with The Biological Photographic Association, Inc. This is a non-profit international organization founded in 1931 for the advancement of photography in the biological sciences. Its Journal is the only publication serving the biological photographer specifically. Every NABT member should become acquainted with the organization and its Journal. Address inquiries to: Lloyd E. Varden, Sec'y, Pavelle Color, Inc., 533 W. 57th St., New York 19, N. Y.

ROBERT L. GERING, *Ecological Research University of Utah*

Dear Sirs:

. . . Your publication alone is well worth the membership dues, and I appreciate the fine work you are doing.

Very sincerely yours,

G. L. CARVER, *Head of Dept. of Biology Mercer University, Macon, Georgia*

Note to Dr. Carver: Why aren't you at home when the Editor drops in to pay you a visit?

SOURCES OF STRIP FILMS AND COLOR SLIDES

A. Advantages of Strip Films and 2x2 Color Slides

Slidefilms or strip films have several advantages over motion pictures: the projector is less expensive and is easier to move; strip films are not expensive, are easy to store, and lend themselves well to short subjects and specific units. Many have been adapted for a particular text, both at the elementary level and college level. It is easy to keep one picture on the screen for a long time while discussing it whereas, with a movie projector, this may result in burning a frame right in the middle of the film sequence or other difficulties. Many projectors are not equipped to permit study of one frame.

2x2 color slides have many advantages over regular lantern slides (3¼x4): it is easier to store the smaller slides; it is very easy to expose 35 mm. color strips for processing into 2x2 slides, dealing with your own subject.

B. Lists and Guides

Audio-visual magazines are listed in our earlier

article on 16 mm. films.[1] Be sure to see *Sound Slidefilm Guide* and complete source list by BUSINESS SCREEN.

Film Strip Guide. The H. W. Wilson Company, 970–972 University Ave., New York 52, N. Y. The most complete single list of sources.

Film Strips. McGraw-Hill Book Company, New York, N. Y. A descriptive index and user's guide.

C. Sources of Strip Films

In the following list of manufacturers and distributors who sell strips for educational purposes, those who also prepare 2x2 slides are indicated by (#), and those also producing 3¼x4¼ lantern slides are indicated by (X).

American Council on Education, 744 Jackson Place, Washington 6, D. C.
American Gas Association, Promotion Bureau, 420 Lexington Ave., New York 17, N. Y.
American Museum of Natural History, 79th St. and Central Park West, New York 24, N. Y.
Stanley Bowmar, 713 W. 166th St., New York 32, N. Y. (Also sells records)
British Information Services (An agency of the British Gov't), 30 Rockefeller Plaza, New York 20, N. Y.
Herbert E. Budek Company, 53 Poplar Ave., Hackensack, N. J.
Coronet Instructional Films, A Division of *Coronet Magazine*, 65 E. South Water St., Chicago 1, Ill.
X # Denoyer-Geppert Company, 5235 Ravenswood Ave., Chicago 40, Ill.
Educational Aids Service, 3034 Thayer St., Evanston, Ill., distributor of Curriculum Films.
Encyclopaedia Britannica Films, 1150 Wilmette Ave., Wilmette, Ill.
X Eye Gate House, Inc., 330 W. 42nd St., New York 18, N. Y.
Filmboard of Canada, Ottawa, Ontario, Canada.
Filmstrip Distributors, 2338 E. Johnson St., Madison 4, Wis.
Frick Chemical Laboratory, Princeton, N. J.
General Biological Supply House, Inc., 761–763 E. 69th Place, Chicago 37, Ill.
X # Geo-Areo-Photo, Box 750, Oklahoma City, Okla.
Jam Handy Organization, 2821 E. Grand Blvd., Detroit 11, Mich. Free correlation chart.
Household Finance Corporation, Consumer Education Dept., Chicago, Ill.
International Film Bureau, Inc., 6 N. Michigan Ave., Chicago 2, Ill.
X Keystone View, Meadville, Pa.
Life Filmstrips, 9 Rockefeller Plaza, New York 21, N. Y.
Macmillan Company, College Dept., 60 Fifth Ave., New York 11, N. Y. Slidefilm series to accompany Mavor: *General Biology*.
Midwest Visual Equipment Company, Inc., 6961 N. Clark St., Chicago 26, Ill.
Modern Talking Picture Service, Inc., 45 Rockefeller Plaza, New York 20, N. Y.
McGraw-Hill Book Company, 330 W. 42nd St., New York 18, N. Y.
National Dairy Council, 111 N. Canal St., Chicago 6, Ill.
Pat Dowling Pictures, 1056 S. Robertson Blvd., Los Angeles 35, Calif.
Popular Science Publishing Company, Inc., Audio-Visual Div., 353 Fourth Ave., New York 10, N. Y.
Row, Peterson and Company, 1911 Ridge Road, Evanston, Ill.
Eastman Kodak Company, Sales Service Div., Rochester 4, N. Y.
Science Service, Inc., 1719 N St., N.W., Washington, D. C.
X # Society for Visual Education, Inc., 1345 Diversey Pkwy., Chicago, Ill.
Stillfilm, Inc., 8443 Melrose Ave., Hollywood 46, Calif.
United Duroc Record Association, Peoria 3, Ill.
U. S. Department of Agriculture, Extension Service, Washington, D. C. For information, see Agricultural Handbook No. 17, *Slidefilms*. To order direct, contact Photo Lab., Inc., 3825 Georgia Ave., N.W., Washington 11, D. C.
Visual Sciences, Box 264, Suffern, N. Y.
X # Ward's Natural Science Establishment, Inc., 3000 Ridge Rd. E., Rochester 7, N. Y.
Wayne University, Audio-Visual Materials Consultation Bureau, Detroit 1, Mich.
X # W. M. Welch Manufacturing Company, 1515 Sedgwick St., Chicago 10, Ill.
X # Western Picture Service, 2174 N. E. Multnomah, Portland 12, Ore.
X # Williams, Brown and Earle, Inc., 918 Chestnut St., Philadelphia 7, Pa.
Young America Films, 18 E. 41st St., New York 17, N. Y.

D. Sources of Free Strip Films

A number of 35 mm. strip films are loaned without charge by many of the free-loan 16 mm. film sources, especially manufacturers of agricultural implements. It is not our plan to list all such sources. The same audio-visual magazines already mentioned in our 16 mm. film sources article [1] contain information on both strip films and slides. The Educators Progress Service, Randolph, Wisconsin, distributes the *Educator's Guide to Free Slide Films*.

In the accompanying list, the starred (*) firms make available permanent free loans to schools.

* Association of American Railroads, Transportation Bldg., Washington 6, D. C.
J. I. Case Company, Inc., Racine, Wis.
* Clorox Chemical Company, 850 42nd Ave., Oakland, Calif.
General Electric Company, Publication and Film Distribution Unit, Advertising and Sales Promotion Dept., Schenectady 5, N. Y., or 840 S. Canal St., Chicago, Ill.
* Health Heroes, Metropolitan Life Insurance Company, 1 Madison Ave., New York 10, N. Y.
The Milk Foundation, 28 E. Huron St., Chicago 11, Ill.
The National Fertilizer Association, 616 Investment Bldg., Washington 5, D. C.
National Epilepsy League, 130 N. Wells, Chicago 6, Ill.
National Foundation for Infantile Paralysis, 120 Broadway, New York 5, N. Y.
Poultry and Egg National Board, 308 W. Washington, Chicago 6, Ill.
Socony-Vacuum Oil Company, Inc., Film Library, 26 Broadway, New York 4, N. Y.
State Departments of Public Health
* Sugar Research Foundation, Inc., Box 137, New York 5, N. Y.

[1] *Material Aids Information*, The American Biology Teacher, Vol. 14, No. 2, pp. 32–37, Feb., 1952; also *Educational Films for Rental or Purchase*, Vol. 14, No. 5, pp. 128–131, May, 1952.

United Air Lines, School and College Services, 80 E. 42nd St., New York 17, N. Y.; 35 E. Monroe St., Chicago 3, Ill.; Sixth and Olive Sts., Los Angeles 14, Calif.; 400 Post St., San Francisco 2, Calif.; 1225 Fourth Ave., Seattle 1, Wash.

* West Coast Lumberman's Association, 410 S.W. Morrison St., Portland 5, Ore.

E. Sources of 2x2 Color Slides

2x2 color slides can be bought from the following sources. If 3¼x4¼ lantern slides also are available, the source is indicated by (X).

The A.B.C. House, Charleston, Ill.

Allen's Photo Studio, 2715 Beverly Dr., Gary, Ind.

American Dental Association, 222 E. Superior St., Chicago 11, Ill.

American Film Registry, 28 E. Jackson Blvd., Chicago 4, Ill.

American Masterpieces, 7121 Pine Ave., Bell, Calif.

B&M Color Slide Service, P. O. Box 77, Chula Vista, Calif.

Best's Studio, Inc., Douglas Whiteside, Yosemite National Park, Calif.

Brooking Tatum, 681 Bayshore, Burlingame, Calif.

Calichrome Slide Agency, 460 W. Longden Ave., Arcadia, Calif.

California Botanical Materials Company, 861 E. Columbia Ave., Pomona, Calif.

Frederick W. Cassabeer, 953 Madison Ave., New York, N. Y.

Clay-Adams Company, Inc., 44 E. 23rd St., New York 10, N. Y.

X Conrad Slide and Projection Company, 709 E. Eighth St., Superior, Wis.

Cooke's Color Slides, P. O. Box 502, Windsor, Ontario, Canada

Crandall Studios, Harrison R. Crandall, Jenny Lake, Wyo.

Esteday Nature Photography, 4340 N. Illinois St., Indianapolis 8, Ind.

C. Edward Graves, P. O. Box 55, Carmel, Calif.

Haynes Incorporated, 801 N. Wallace Ave., Bozeman, Mont.; Yellowstone National Park, Wyo. (summer address)

Ideal Pictures Corporation, 28–34 E. Eighth St., Chicago 5, Ill.

Kodak Hawaii, Ltd., 1065 Kapiolani Blvd., Honolulu 7, Hawaii

Lt. Commander Clifford J. Lishman, USN, P. O. Box 132, La Jolla, Calif.

National Audubon Society, Photo and Film Dept., 1000 Fifth Ave., New York 28, N. Y.

National Wildlife Federation, 3308 14th St., N.W, Washington 10, D. C.

Northern Color Film Company, Robert A. Hall, Box 22, Moose Pass, Alaska

New York Scientific Supply Company, 28 W. 30th St., New York 1, N. Y.

Paul W. Nesbit, Moraine Park Road, Estes Park, Col.

Carl B. Obrecht, 726 Gladstone, Detroit 2, Mich.

Harry Reed, Moab, Utah

Henry Van Scofield Color Productions, 299 W. 12th St., New York 14, N. Y.

West View Color Slide Club, 1518 Montana Ave., Santa Monica, Calif.

JAMES M. SANDERS, and Committee
Chicago Teachers College

Biology Clubs as Teaching Tools*

ROBERT L. SMITH, DeKalb Township High School, DeKalb, Illinois

As I listened to an industrial arts teacher tell of the advantages of a mechanical saw, I too thought of my favorite tool. It is a teaching tool which costs nothing, and it gives students a chance to put textbook knowledge into practical application. It is the biology club that cares for individual differences and stimulates regular class activities.

1. The biology club is at its best for the teaching of conservation. Surveys of farms are made, and the needs for conservation are discussed with the farm owners. Practical work is carried out, such as the prevention of soil erosion, emergency pheasant feeding, and the planting of the multi-flora rose for wildlife cover. The club saves its own seed and raises the plants of the multi-flora rose for free distribution.

In a pollution survey of the Kishwaukee, a stream that runs through DeKalb, we got over a ton of debris from a one-hundred-yard strip, and we removed forty fish that recently had been killed where raw oil was being dumped. The fact that these conditions existed in our own community made the problem more real.

2. The biology club is a means for developing student help which may be more effective than a presentation by the instructor. Two boys made an electric model of a reflex action and conscious thought by means of lights that showed the paths followed when the two types of nervous reactions took place. Everyone in the class clamored to pull the switches and to see the reactions happen. The class also learned the reactions.

The club had members of the class and their relatives to taste paper soaked in phenyl-thio-carbamide, a chemical that has a

* Condensed from a report to The National Association of Biology Teachers, AAAS, December 29, 1952, St. Louis, Mo.

These students obtained a practical insight into the problem of pollution when they removed over one ton of debris from a 100-yd. strip of the Kishwaukee, a stream that runs through DeKalb, Illinois. *From left:* Joe Kelly, Linda Shoemaker, Paul Schafer, Gilbert Kyler, Don Vilmin, and Perry Ebbeson.

different taste to different people. When all of the results were analyzed heredity had been taught in a painless way.

3. The biology club can be used as a tool for assuring a living laboratory. Our club has over sixty different species of living animals in the laboratory, representing over eight of the ten phyla studied, and it has over sixty different species of plants representing all four of the plant phyla. In this collection one can nearly always find the living organism that is needed for getting across a point in class. Pride of ownership encourages cleanliness in the zoo.

4. The biology club can add much to the effectiveness of a teacher's presentation of materials through models and projects of club members. At the same time the Department saves money. Our club members have worked out a method of making laboratory models from regular modeling clay of different colors and then making them permanent by spraying with Krylon, a liquid plastic solution. Usually more detail is put into the models than on those bought from supply houses, and all that the models cost is the few

The students are learning the reflex arc and conscious thought pathways by means of an electrical device that shows a series of lights where the nerve impulses travel. *From left:* Deen Quarnstrom, John Moore, Eugene Vesta, Bill Kayes, Dick Johnson, and Richard Secrest.

dollars paid for raw materials. The development of the model of the nervous system has already been described, and now the structure of the heart is being worked out. Embedding fragile material in clear plastic is another popular project that gives the class material that is easily handled.

5. The biology club is a tool for developing visual aids for classroom use. Films have been taken of our club activities, especially those that illustrate correct conservation methods; and of those that illustrate techniques and results of various other projects. Photomicrography has also added beautiful Kodachromes to the collection. The films when used in talks before local service organizations are a popular stimulus for better relations between the school and community.

6. The biology club is a tool for stimulating original research among its members. Such things as cancer, owl pellets, wood duck nesting, maze experiments with rats, hydroponics, and highway slaughter of animals have served as research topics. Not only does the whole class become interested in these research problems, but as in the case of highway slaughter many students outside of the biology class aided with their observations. In addition science club projects develop the interest of outstanding students beyond the one year in the biology course.

7. The biology club is a tool for helping young people to find out whether their life work should be in certain fields of science. Pre-nursing, pre-surgery, laboratory technique, forestry, wildlife management, and teaching are all vocations that club members may investigate. Project activity in the club gives practical experience in the field that the student wishes to consider.

8. The biology club is a tool for keeping the instructor abreast with the latest developments in science and preventing boredom in repetitious textbook material. The club activity that has been described is one way of keeping the better type biology teacher from leaving the high school field and moving into college. No teacher can suffer from boredom when surrounded by members of an active biology club, eager to delve into the mysteries of science. Our club is a living, vibrant organization, radiating interest and activity about which the whole biology course revolves.

The Biology Club maintains animals that are useful in class. *Left:* Don Gilkison feeding a mother rat. *Right:* Dick Carlson feeding a mother rabbit.

Biology Laboratories

By: "The Old Fossil," at Wells High School, Chicago

Obituary Notice! "Biology Laboratories" died July 4, 1953 at Chicago; nearest of kin, "The Old Fossil." B L will be formally decapitated come midnight, Dec. 31, 1953. Ed'r Vance issued this edict to TOF—"Get ahead with a new Head, but make it catchy-snappy, Grandpappy! So TOF must do a bit of osteological plastic surgery, and **YOU** can help. The title, *Biology Laboratories*, is threadbare, obsolete, antiquated—in brief, it just plain stinks! Here are some substitute suggestions: *Biological Diary; Biological Brieviews; Biodigest; Biodust; Bio-meants For Comments; Nurturing Nature; Planimal Pointers; Bio-plans for Pupil-Pushers; A Biological Em Pica or Two; The Old Fossil's Column;* and *Bioliving*. Or do you want the column at all? To prevent TOF from going down the drain with B L, write TOF and suggest a new title, or choose from the preceding list. Also send in a suggestion or two for the column, and your reaction to it. Do it now! Reward for your effort will be a special Honorary Degree and Certificate, suitable for framing. TOF still has a bit of paper board up the sleeve of his shroud. Address: "The Old Fossil," 5061 N. St.

Louis Ave., Chicago 25, Ill. New-broom Editor Vance asks for many **"How To Do It's"** in this column. I hope there are a few here. TOF must now hasten back to his limestone strata niche (as Muriel B. so deftly put it in a recent letter to TOF).

TOF apologizes for the delay in sending "Thirteen Snake Superstitions." Duplicates were finally made from a file copy. Copies were sent this summer to **Sister Maria Laurence,** Marywood College, Scranton, Pa., and to **A. V. Donnellan,** Jamaica Plains H.S., Boston, Mass. Ed'r Vance, this is a splendid "How *Not* To Do It!"

A nested aluminum mess kit, consisting of one pie tin and one frying pan w/handle—both 7" in diameter, cup w/handle, and one 5" pot w/bail is available at your local scout depot; excellent for field trips.

White rats, produced commercially by the hundreds of 1000's monthly, come from but a very few ratteries in the U.S., and fewer abroad. Last spring **Paul D. Henderson** invited TOF to a rattery in Madison. PDH and TOF were not permitted to view the rearing room, but did see such a new room being constructed. 25,000 rats per month are shipped. The strain is started by sterile **Caesarean operation** to prevent contamination. They live under artificial, hygienic, and sanitary conditions, and are mated by free inbreeding for uniformity. The strain usually lasts four to five years. When variations begin to appear, a new strain is started again by Caesarean section. Standing orders are booked months in advance. Some researchers maintain full orders from two separate firms in case one strain "goes haywire." The technical know-how is more closely guarded than in an atomic plant.

Fifteen scientists, including TOF, were invited to visit the **Argonne National Atomic Laboratories.** Personnel data were submitted weeks in advance for security investigation. A motor caravan took the group from the main laboratories and administration building to the top of a hilly area a few miles distant, which was fenced and brightly lighted. TOF presented identification, was checked on a large data sheet, badged, and handed a radiation counter for use at the reactor-piles. Experimentation is not carried on at the two piles visited, one graphite and the other heavy-water. The **graphite pile** was a huge block of concrete the size of a 2-story 8-room house. An hour was spent in the control room of the heavy-water pile. Controls, and controls to check controls, were located in the walls of this room; there were dials, lights, warning signals, and recording devices, all electronically operated. The group then moved to the **heavy-water pile** room, where materials are placed in small holes in the walls to be radiated. The group saw a number of mice being subjected to reactor radiation. Security is essential. Guards were present everywhere, except about the piles, and the area is continually patrolled. One single act of carelessness could contaminate the whole area and endanger thousands of lives. A visit to such a place is a real education for teachers.

Snow White, the junior member of the firm's pet rabbit, is wintering in the Florida climate of the animal room here at Wells. Liked foods are lettuce, endive, carrots, asparagus tops, and pea vines in that order. Cabbage and apples are at the bottom of the list. Rabbits will eat grain and prepared pellets when fresh food is not in abundance.

Honeybees produced a good crop for TOF this year. He started out last spring with one colony and ended up with many. Bees played an important part in his summer activities. One learns about insects very rapidly from honeybees—often the hard way. 95% of a person's aversion to honeybees is his fear and lack of understanding of bees. The other 5% is the bees' disinclination to be disturbed from their routine.

TOF has had good luck pollinating **amaryllis,** producing seeds, and rearing plants. Two choice blooming plants are selected. Pollen transfer is completed. In a fortnight seeds are formed. These are generally sown around the base of some newly potted plant which will not need shifting for a couple of years. More than one season of growth is necessary to produce bulbs. You will notice the broad leaf of the seedling when germination is complete.

Adhesive tape, folded over one edge of a double-edged **safety razor blade,** coverts it into a less dangerous instrument. Metal and plastic holders can be bought cheaply at variety stores. Plenty of used blades can be had for the asking from pupils with safety-razor-brandishing fathers or brothers. Put a notice of your needs for such things on your blackboard or the school's Morning Bulletin. An empty wooden **chalk box** is fine to hold sharp instruments too dangerous to be put loosely in a drawer; force the points into an end of the box.

Eugenics Pamphlets, No. 66AA, 16 pp., is free to schools while the supply lasts. Write to NABT Adviser **C. M. Goethe,** 720 Capitol Bank Bldg., Sacramento, Calif.

Lawn Care, house organ of O. M. Scott and Sons Co., Marysville, O., may be had free. It is of interest to lawn enthusiasts, and good

for special reports and experiments. Congratulations to **the Scotts** on 25 years of continuous publication!

Dissecting pans can be repaired. Remove the black tar-based wax in pieces, and put on newspaper to dry. Discard pans which leak or are badly bent. Restore others to shape by using a wood block and hammer. Clean and set them on a level surface. Heat the wax in a clean coffee can. Do not let it smoke or catch on fire. When melted, fill each pan about ¼ to ½ in. deep with wax. They are ready for use when cool. More wax may be purchased, or made cheaply from equal parts of beeswax and paraffin with some lampblack added.

Common Diseases of Livestock, Lederle Laboratories, 30 Rockefeller Plaza, New York 30, N. Y., is a 32-page pamphlet on treatment of animal diseases. It is excellent for special reports on mammals, and is **free.**

The Teaching of Biology in the Public High Schools of the United States, Bulletin No. 9, U. S. Office of Education, Washington, D. C., is a good "sumview" of biology compiled from a questionnaire and fine for your professional library.

Insects, Yearbook of Agriculture for 1952, U. S. Dept. of Agr., Washington, D. C., contains nearly 900 pages of information, 36 color plates of a select group of insects, and descriptions. It is worth a letter to your Congressman, or the nominal price of $2.50. Excellent for reference.

Cannas are used extensively for home and school plantings. Leave them in the soil until the first heavy frost; lift before the ground freezes solid. Leave soil on the clump, and store in baskets of dirt in the basement. Water once during the winter. Six weeks before the last spring freeze, cut away dead parts, remove soil, and put one growing tip in each of 4 or 5 in. pots. Use a mixture of 2 parts loam, one part leaf mold, and one part sand in the pots. Keep them cool, shaded and inside for three weeks, and water frequently. Then place in full sunlight. Plant out when danger of frost is past. They run to reds, yellows, pinks, and variations. Two or three years work will greatly increase your yield. They bloom from late midsummer to frost time.

An excellent business opportunity is open for one or two biologists. A knowledge of biological supplies is desirable. A small amount of capital is needed to cover materials costs. The business can be operated on a full or part-time basis. If interested, write to "The Old Fossil," 5061 N. St. Louis Ave., Chicago 25, Ill.

Mrs. Hubbard solved the "pencil problem" in her classes by buying several dozen pencils at a time; sells them to "Teacher, I don't have a pencil" pupils at cost; it is effective in keeping chronic "pills" from becoming headaches during class and Lab. sessions. Another teacher sells ink at a penny a fill for student aid; another sells paper two sheets for a cent.

Books For Busy Biologists

MOMENT, GARDNER B. and CLOSE, HELEN V. *Foundations of Biology, A Laboratory Handbook.* Appleton-Century-Crofts Inc., New York. iii + 282 pp. 1953.

This excellent college workbook contains 40 units for laboratory study. Included are classical experiments, recent discoveries, as well as others that deal with fundamental principles. Both plant and animal materials are used.

The first 132 pages give directions under the headings of "Importance and Purpose," "Materials," "Procedures," and "References." The remainder of the book consists of work sheets for drawings and observations.

Anyone using Moment's *General Biology* as a text would find this book very useful. The directions given are helpful for anyone who conducts laboratory courses in general biology.

M. A. RUSSELL,
Junior College,
Highland Park, Mich.

JONES, ARTHUR W. and CARPENTER, JOHN M. *Microtechnique. A Student's Guide to Slide Making.* Burgess Publishing Company, Minneapolis, Minnesota. ii + 39 pp. 1952. No price stated.

A concise spiral-bound paper-covered booklet which gives the essential principles for slide-making. The guide is not intended to be a manual or textbook, but is to be used along with the many excellent manuals and texts in the field. A list of 11 selected, but far from complete, reference books are given in the bibliography. The booklet starts with detailed instructions on the use of the microscope and its accessories and proceeds from there to the preparation of smears, squashes, macera-

tions and whole mounts. There are sections on frozen and paraffin sections and simple staining techniques. This booklet would be of use to advanced high school students and for elementary college students.

CHARLES C. HERBST,
Beverly Hills High School,
Beverly Hills, California

Bulletin of the International Committee for Bird Preservation. Published by The International Committee for Bird Preservation, New York, c/o The American Museum of Natural History. 248 pp. $1.75 plus $.15 postage.

This book, a report of recent activities and meetings of the International Committee, is important to all who are interested in what is being done about bird preservation on a world-wide scale. Reports from 23 countries, representing all the continents, are included. The book has a use that may not have been anticipated. It is a fine practice device for prospective Ph.D. candidates and others who need some practice in reading foreign languages, for all reports are presented in English, French, German and Spanish.

FITZPATRICK, FREDERICK L. and BAIN, THOMAS D. *Living Things.* Henry Holt and Company, New York. xiv + 415 pp. illus. 1953. 03.60.

Living Things is written in simple enough language so that the somewhat below average high school sophomore will not have much trouble reading it. The 82 chapters are organized into eight units, each divided into from one to four topics. New technical words are defined at the beginning of each topic. Each topic closes with a summary, a list of practical questions, and a group of suggested activities. A more general summary ends each unit. There are many cartoon-type drawings. Compared with most present day books, there are relatively more drawings and fewer photographs. The glossary and index are adequate. The authors say in the preface that "The typical non-academic student who shows a great resistance to traditional science instruction, but who is keenly interested in the world outside of his school, will find in *Living Things* a textbook geared to his needs." This reviewer agrees.

PENNAK, ROBERT. *Fresh-Water Invertebrates of the United States.* The Ronald Press Company, New York. ix + 769 pp. illus. 1950. $14.00.

This first comprehensive work on American freshwater invertebrates since Ward and Whipple (1918) is, according to the author, "a text and reference pitched toward the level of the college senior and beginning graduate student." But the high school biology teacher, and even the advanced high school biology student, can use the book for any group of animals in which he is interested. Each of the 37 chapters has genus or species keys, with excellent illustrations. The text is clear and concise; there are of course many technical terms but, when common names are available, they are used. The general features, locomotion, food, internal anatomy and physiology, reproduction, life cycle, ecology and taxonomy of each group are discussed. Each chapter has a list of references. The appendix covers field and Lab equipment, reagents, and solutions. This book is an essential wherever freshwater biology is studied.

JOHN BREUKELMAN

ROGERS, J. SPEED, HUBBELL, THEODORE H. and BYERS, C. FRANCIS. *Man And The Biological World.* 2nd ed. McGraw-Hill Book Company, New York. xiv + 690 pp. illus. 1952. $5.75.

The revised edition of this survey text has as its central theme, Man's place in the living world. Discussions of mitosis, meiosis, and evolution have been rewritten and brought up to date. The subject matter is treated in four major parts. Part I includes the cell and protoplasm, organization of the individual organism, structure and function of the human body, function and structure of higher plants and other patterns of individual organization. Part II reviews reproduction, both plant and animal, and inheritance and variation. Part III covers material on paleontology, evolution, and ecology. Part IV deals with the economic and social interrelationships of organisms.

One noteworthy feature of this book is the excellent illustrative material. There is an extensive appendix which the authors designed primarily for reference use. College students not interested in specializing, but desirous of an over-all survey of biological principles, will find this text adequate.

MELVIN A. HINTZ,
South Milwaukee High School

GARDINER, MARY S. *The Principles of General Biology.* The Macmillan Company, New York. xvi + 657 pp. illus. 1952. $5.75.

General Biology is designed for a full year of study in college. The text is thorough and is written in erudite phraseology. It is divided into three chief sections: (1) the techniques of physics and chemistry as a background to elementary biology; (2) a comparative study of the biological systems in which the lower forms of plants and animals are included in the same unit; and (3) the study of the physiology and anatomy which emphasizes the trends in evolution. Generalizations and summaries are omitted "to encourage the student to make his own judgments."

The double columns in a modern style of 8 pt. type include much material. This material would be valuable also as a reference book for high school teachers.

ROBERT C. MCCAFFERTY,
Wadsworth High School,
Wadsworth, Ohio

YOUR ASSOCIATION OFFICERS AND EDITORIAL STAFF

In order that readers may know who have the major responsibilities for the activities of THE NATIONAL ASSOCIATION OF BIOLOGY TEACHERS and the publication of *The American Biology Teacher,* it is the policy of the Journal to publish twice each year a complete list of NABT officers and Editorial Staff members. Chairmen and personnel of committees are published in connection with reports of their activities. All are aggressively interested in the continuing forward progress of your Association and its official Journal, and welcome your suggestions and criticisms. Manuscripts for major articles should be sent directly to either of the Associate Editors, or to them through any one of the Assistant Editors. Regional and Affiliate News should be sent to Ass't Editor H. Charles. Articles and items slanted toward nature study and life science teaching in the elementary grades should be cleared through Ass't Editor M. Gabrielle. News about individuals, and other items, should be sent directly to the Editor-in-Chief. Any member of The Editorial Staff will be happy to give assistance to anyone interested in submitting articles and other items for possible publication.

Association Officers

President: Leo F. Hadsall, Fresno State College, Fresno, California
President-elect: Arthur J. Baker, Crystal Lake Community High School, Crystal Lake, Illinois
First Vice-President: Lydia Elzey, State College, Pennsylvania
Second Vice-President: Brother H. Charles, Saint Mary's College, Winona, Illinois
Immediate Past President: Harvey E. Stork, Carleton College, Northfield, Minnesota
Secretary-Treasurer: John P. Harrold, 110 East Hines St., Midland, Michigan
Nat'l Membership Chairman: H. Seymour Fowler, Iowa State Teachers College, Cedar Falls, Iowa

Editorial Staff

Editor-in-Chief

B. Bernarr Vance
Route 1, Box 175, Dayton 5, Ohio

Associate Editors

Robert McCafferty
371 Broad Street
Wadsworth, Ohio

Paul Klinge
246 Ohmer Avenue
Indianapolis 19, Indiana

Associate Managing Editor

Robert Gering
Dugway Proving Grounds
Tooele, Utah

Managing Editor

Muriel Beuschlein
6431 South Richmond
Chicago 29, Illinois

Assistant Editors

Ted F. Andrews
State Teachers College
Emporia, Kansas

Philip E. Foss
Hartford Public H.S.
Hartford 5, Conn.

Charles C. Herbst
Beverly Hills High
Beverly Hills, Calif.

Bro. G. Nicholas*
La Salle High School
Cumberland, Maryland

Bro. H. Charles
St. Mary's College
Winona, Minnesota

Sister M. Gabrielle
Mount Providence
Pittsburgh 34, Pa.

Melvin A. Hintz
So. Milwaukee High
South Milwaukee, Wis.

O. D. Roberts
Purdue University
Lafayette, Indiana

E. C. Colin
Chicago Teachers Coll.
Chicago 21, Illinois

S. David Greene
P.O. Box 105
Cheshire, Conn.

Marcellus C. Miller
Phillips High School
Battleboro, N. C.

M. A. Russell
Junior College
Highland Park 3, Mich.

Elmo Stevenson
So. Oregon College
Ashland, Oregon

J. A. Trent
Oklahoma Baptist Univ.
Shawnee, Oklahoma

Richard F. Trump
Ames Sr. High School
Ames, Iowa

Advisory Staff

John Breukelman
State Teachers College
Emporia, Kansas

D. F. Miller
The Ohio State Univ.
Columbus, Ohio

B. C. Gruenberg
100 Central Park South
New York, N. Y.

M. C. Lichtenwalter
Lane Tech. High School
Chicago, Illinois

C. M. Goethe
Seventh and J. Streets
Sacramento 14, Calif.

Oscar Riddle
Plant City
Florida

Biology in the News

You'll Be Hearing More About Enzymes, J. D. Ratcliff, *Collier's,* Oct. 16, 1953, pp. 27–29.

Interesting and thought-provoking. For your better students.

Whitetail Dilemma, J. P. Linduska, *Hunting and Fishing,* Oct. 1953, pp. 18–19; 31–35.

Plants in cut-over forests make ideal cover and forage for whitetail deer. Worth filing in your Conservation folder.

CASMT ANNUAL CONVENTION

The Central Ass'n of Science and Mathematics Teachers cordially invites you to their annual meeting Nov. 27–28 at the Congress Hotel, Chicago, Ill. A worth-while program has been planned around the theme: "Stimulating Interest in Science and Mathematics." Chicagoland NABT members will be there to greet you. Write to Ray C. Holiday, Treas. and Business Mgr., Box 408, Oak Park, Ill., for further information, programs, and reservations.

Bio-Buy-Lines

We publish frequent lists of books and reprints in all branches of natural science. Let us know your interests. Please mention ABT. John Q. Burch, 1584 W. Vernon Ave., Los Angeles 62, California.

ANY BOOK YOU WANT, WE HAVE IT, OR WILL TRY TO GET IT FOR YOU. One-third million books in stock. 10,000 books of interest especially to biologists. Write for free Directory B describing our complete book service.
THE SHOREY BOOK STORE
815 Third Ave.
Seattle 4, Washington

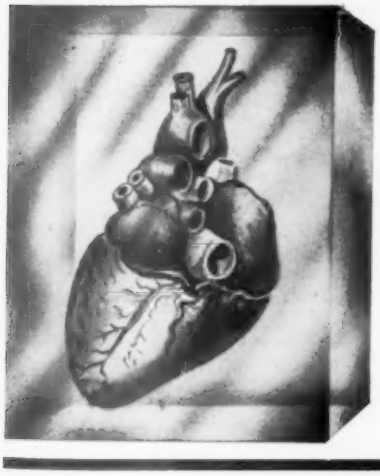
CONNECTICUT VALLEY SUPPLY CO.
LIVING & PRESERVED
BIOLOGICAL MATERIALS
Write for our new catalogue
89 Kent Road Springfield 8, Mass.

LIVE FROGS & TURTLES
from
Wisconsin's oldest & largest frog dealer.
E. G. HOFFMAN & SON
P. O. Box 815 - Oshkosh, Wis.

Biological Supply Catalog and Current Live Reptile List free to teachers. Quivira Specialties, Topeka 59, Kansas.

MARINE BIOLOGICAL
LABORATORY
Complete stock of living and preserved materials for Zoology, Botany, and Embryology including Protozoan cultures, and Microscope slides.
Catalogues on request
Address Supply Department
MARINE BIOLOGICAL
LABORATORY
WOODS HOLE, MASS.

PLASTICAST **FOR PERMANENT PRESERVATION OF BIOLOGICAL SPECIMENS**



PLASTICAST is a transparent clear liquid plastic (refractive index, 1.5). All forms of biological life, sections or whole small creatures, as well as organs, can easily and quickly be PRESERVED FOREVER without deteriorating simply by imbedding in PLASTICAST! *The entire process is as easy as pouring water out of a glass and takes less than 30 minutes!* A few drops of catalyst are added to the liquid plastic before imbedding. Ideal for biological work of all kinds. Price per gallon (including catalyst and complete directions), postpaid $19.50
Trial pint (including catalyst), postpaid .... $ 3.00

PLASTICAST COMPANY
P. O. BOX 987, Dept. 13 PALO ALTO, CALIF.

NOTICE TO CONTRIBUTORS

Manuscripts for publication in THE AMERICAN BIOLOGY TEACHER should be typewritten, on one side only, on standard white paper, 8½ x 11 inch size, with a margin of at least an inch on all sides. The writer should keep a carbon copy for reference and as insurance against loss of the original in transit.

Articles are scheduled for publication in approximately the order of acceptance of the manuscripts. Generally the journal is tentatively arranged about three or four issues ahead, and there are under consideration at any time enough manuscripts for about two or three more issues. Some space is of course allowed for news items and articles of a seasonal nature. Many seasonal papers have to be postponed an entire year, simply because the author has not allowed the necessary four to six months that intervenes between acceptance and publication.

For details concerning titling, headings, references, illustration, etc., consult *Preparation of Manuscripts for Publication*, which appeared in the November, 1949, issue of THE AMERICAN BIOLOGY TEACHER. A limited number of reprints is available; copies may be obtained from the editor or from the Secretary-Treasurer.

Manuscripts for major articles should be submitted to either of the two Associate Editors or, to them, through any one of the Assistant Editors. Individual, local, regional, national, and international news items should be sent to the Editor-in-Chief; also filler items. Names and addresses of the Officers and Editorial Staff members appear in the November and March issues. Criticisms and suggestions are welcomed.

BACK NUMBERS

Most issues of the American Biology Teacher, except those of 1938–39 and 1939–40, are available.

For information write

JOHN P. HARROLD,
110 East Hines St.,
Midland, Mich.

The contents of previous issues of *The American Biology Teacher* can be found by consulting the *Education Index* in your library.

To All Readers:

If you enjoy The American Biology Teacher, have some friend send in this application.

THE NATIONAL ASSOCIATION OF BIOLOGY TEACHERS
JOHN P. HARROLD, Secretary-Treasurer,
110 East Hines St., Midland, Mich.

☐ NEW
☐ RENEWAL

I hereby apply for membership in The National Association of Biology Teachers and enclose $3.75* as my annual membership dues $3.00 of which is for a year's subscription to the American Biology Teacher. (Subscription may not be had separately)

M

Please Print Name

Street and Number

City and State

SCHOOL..... POSITION.....

Local biology teachers association of which I am a member .....

* Outside of United States $4.50.

Please mention THE AMERICAN BIOLOGY TEACHER when answering advertisements